

**ABSTRACT OF THE DISCLOSURE**

A system and method of logging audio signal data implement a data buffer and a non-volatile data storage medium. Acquired audio data may be stored in the buffer temporarily, for example, until a threshold amount or volume of data has accumulated in the buffer. Buffered audio and other data may be written to the non-volatile storage medium in large blocks, minimizing the number of write operations to the non-volatile storage medium. System or process diagnostics may be performed based upon analysis of the acquired audio signal data. Additionally, monitored audio signal data may be employed for real-time process or system control.

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